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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER
HENRY, MATTHEW ALLAN

ART UNIT	PAPER NUMBER
2116	

DATE MAILED: 12/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/015,544	PLUNKETT ET AL.
	Examiner	Art Unit
	Matthew A. Henry	2116

-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figures 1-13 are of poor quality and at times hand drawn and difficult to read. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

1. Claim 22 is objected to because of the following informalities:

On Page 29, Line 15 of the claim, the word "acqusition" should be replaced with "acquisition" to be correct.

2. Claim 40 is objected to because of the following informalities:

On Page 31, Line 1 of the claim, the dependency is claimed to be on Claim 29; it is expected that the dependency should be upon Claim 36.

Appropriate correction is required.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 8, 15, 22, 29 and 36 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 18, 33, 53 and 22 of copending Application No. 09/815,122 in view of Hardwick.

The amended claims for Application No. 09/815,122 cite the limitations put forth in the present application except for the specific functions performed by the reconfigurable hardware and the detection of idle functions for the purposes of causing a reconfiguration of the hardware.

The copending case, though it does not specify a system acquisition function and a communication function, still reads on the present application because of the breadth of its claims.

Further, as outlined above in the 103(a) rejection for Claims 1, 8, 15, 22, 29 and 36, it would have been obvious to combine the teachings of Hardwick with copending application 09/815, 122 so that the reconfigurable system can detect a reason to reconfigure its hardware.

This is a <u>provisional</u> obviousness-type double patenting rejection. It should be noted, however, that copending application 09/815,122 is scheduled for issuance on 12/28/2004.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 8-10, 15-17, 22-24 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (6,353,841) in view of Bertolet (5,910,733), Vilmur (5,950,131), Tiedemann (5,870,427) and Hardwick (6,292,822).

Concerning Claims 1, 29 and 32, Marshall discloses:

Applicant should note that Claims 1, 8, 15, 22, 29 and 36 are similar to the claims in U.S. Application No. 09/815,122 in that they correspond to the originally filed claims but include additional limitations directed to specific functions.

A communication device configured to perform a plurality of functions, comprising:

A plurality of computational elements (Figure 1, Item 10; Column 5, Lines 52-55);

And an interconnection network coupled to the plurality of computational elements (Figure 2, Items 16, 18 and 20), the interconnection network operative to configure the plurality of heterogeneous computational elements (Column 10, Lines 38-44);

Wherein a first group of computational elements is configurable to form a first functional unit to implement a first function (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively);

Wherein a second group of computational elements is configurable to form a second functional unit to implement a second function (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively).

Marshall does not disclose

The computational elements are heterogeneous.

Further, he does not disclose the first and second functions being a system acquisition function and a communication function, respectively.

Further, he does not disclose the second group of computational elements as being reconfigurable to implement the system acquisition function if the communication function is idle.

Bertolet teaches:

A plurality of heterogeneous computational elements (Columns 1 and 2, Lines 63-67 and 1-4, respectively).

Marshall discloses it would be "desirable to develop reconfigurable structures which combine as best possible the advantages of both MATRIX and of conventional FPGAs" (Column 3, Lines 2-4). Bertolet teaches FPGAs are "heterogeneous in nature" (Column 1, Line 67).

Accordingly, it would have been obvious to a person of ordinary skill in the art that the heterogeneous nature of FPGAs as noted by Bertolet would be an important feature in the device disclosed by Marhsall because it would enable his device to be "programmed at different times with different configurations, each adapted for execution of a different computationally intensive task (Column 1, Lines 65-67). Also, please refer to the Office Action dated 12/29/2003 for currently copending application 09/815,122, wherein the above rejection was set forth by the previous examiner and which resulted in applicant's amendment of the claims which recited these limitations.

Regarding the claimed second functional unit, it is considered inherent to a communication device that a functional unit will be used to implement a communication function.

It would have been obvious to a person of ordinary skill in the art to use a reconfigurable computing device to implement a communication function because said function is inoperative until a system acquisition function has successfully acquired a signal and therefore would otherwise be wasting computing resources.

Vilmur teaches:

A functional unit to implement a system acquisition function (Figure 1, Items 116, 114 and 128; Column 6, Lines 35-43).

Additionally, Vilmur teaches, "The long time delay in system acquisition is inconvenient and undesirable for users" (Column 2, Lines 23-24).

Tiedemann underscores this teaching by saying "the discontinuity of service resulting from the requisite acquisition time may be unacceptable in a voice system" (Column 3, Lines 45-47). From this assertion, it should be evident that wireless communication cannot be supported without the acquisition of a signal.

The applicant admits as prior art that "The amount of acquisition time is directly proportional to the amount of hardware dedicated to the system acquisition task" (Paragraph 12, Lines 3-4). Accordingly, it would have been obvious to a person of ordinary skill in the art at the time of the invention to implement a system acquisition function with a reconfigurable computing device so that more computing resources may be dedicated to this important initial

task so that the communication service may be provided as soon as possible while having some resources reassigned to other task once this startup phase has completed.

Hardwick teaches of detecting whether a processor is idle or not (Figure 7, Item 708).

Hardwick teaches the detection of idleness allows for efficient use of the available computation resources in a system (Column 4, Lines 26-29).

It would have been obvious to a person of ordinary skill in the art to detect the activity of a processor in a reconfigurable device so that the device may be reconfigured accordingly.

The applicant has already conceded that the combined teachings of Marshall and Bertolet read on the claims as specified as shown in related application 09/815,122. The additional limitations put forth in these claims only serve to clarify a specific implementation of the claimed invention put forth in the parent case. However, Vilmur, Tiedemann and Hardwick provide teachings demonstrating motivation for using the teachings of Marshall and Bertolet in a communication device as described in claims.

Accordingly, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the teachings of Marshall and Bertolet in combination with the teachings of Vilmur, Tiedemann and Hardwick for the purposes of making a communication device with faster system acquisition time without greatly increasing the costs and the size of the device by implementing the system acquisition components and other communication functions which will not function without system acquisition on a reconfigurable computing device.

Concerning Claims 2 and 30, Vilmur further teaches:

the first functional unit is a searcher (Figure 1, Item 114).

Concerning Claims 3 and 31, Vilmur further teaches:

the communication device is a cellular phone (Figure 1, Item 104).

Concerning Claim 8, Marshall discloses:

a plurality of reconfigurable matrices (Figure 1), the plurality of reconfigurable matrices including a plurality of computational units (Figure 1, Item 10; Column 5, Lines 52-55), each computational unit having a plurality of fixed computational elements (Figure 1, Items 12 and 14), the plurality of fixed computational elements including a first computational element having a first architecture (Figure 1, Item 12; Column 5, Lines 62-65) and a second computational element having a second architecture (Figure 1, Item 14; Column 5, Lines 65-67), the first architecture distinct from the second architecture, the plurality of heterogeneous computational units coupled to an interconnect network (Figure 2, Items 16, 18 and 20) and reconfigurable in response to configuration information (Column 10, Lines 38-44); and

a matrix interconnection network coupled to the plurality of reconfigurable matrices (Figure 2, Items 16, 18 and 20), the matrix interconnection network operative to reconfigure the plurality of reconfigurable matrices in response to the configuration information for a plurality of operating modes (Column 10, Lines 38-44);

Wherein a first group of computational elements is configurable to form a first functional unit to implement a first functional mode (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively; it is taken that a reconfigurable entity will be in the configuration mode that

the reconfigurable entity is configured to function as – e.g. being configured to perform a system acquisition function puts the configurable entity in a system acquisition mode);

Wherein a second group of computational elements is configurable to form a second functional unit to implement a second functional mode (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively).

Marshall does not disclose

The computational elements are heterogeneous.

Further, he does not disclose the first and second moes being a system acquisition function and a communication function, respectively.

Further, he does not disclose the second group of computational elements as being reconfigurable to implement the system acquisition mode if the communication mode is idle.

Bertolet teaches:

A plurality of heterogeneous computational elements (Columns 1 and 2, Lines 63-67 and 1-4, respectively).

Marshall discloses it would be "desirable to develop reconfigurable structures which combine as best possible the advantages of both MATRIX and of conventional FPGAs" (Column 3, Lines 2-4). Bertolet teaches FPGAs are "heterogeneous in nature" (Column 1, Line 67).

Accordingly, it would have been obvious to a person of ordinary skill in the art that the heterogeneous nature of FPGAs as noted by Bertolet would be an important feature in the device disclosed by Marhsall because it would enable his device to be "programmed at different times

with different configurations, each adapted for execution of a different computationally intensive task (Column 1, Lines 65-67).

With respect to the added limitations, the following teachings apply:

Regarding the claimed second functional mode, it is considered inherent to a communication device that a functional unit will be used to implement a communication mode.

As discussed in reference to claims 1, 29 and 32, it would have been obvious to modify Marshall in view of Bertolet to include the specific function limitations in view of the teachings of Vilmur, Tiedemann and Hardwick.

Concerning Claim 9, Vilmur further teaches:

the first functional unit is a searcher (Figure 1, Item 114).

Concerning Claim 10, Vilmur further teaches:

the communication device is a cellular phone (Figure 1, Item 104).

Concerning Claim 15, Marshall discloses:

a plurality of computational elements (Figure 1, Item 10; Column 5, Lines 52-55), the plurality of computational elements including a first computational element (Figure 1, Item 12) and a second computational element (Figure 1, Item 14), the first computational element having a first fixed architecture (Figure 1, Item 12; Column 5, Lines 62-65) of a plurality of fixed architecture and the second computational element having a second fixed architecture (Figure 1, Item 14; Column 5, Lines 65-67) of the plurality of fixed architectures, the first fixed

architecture being different than the second fixed architecture, and the plurality of fixed architectures including functions for memory, addition, multiplication, complex multiplication, subtraction, configuration, reconfiguration, control, input, output, and field programmability (Columns 13 and 14, Tables 2-4; Functions for addition, subtraction, input, output, etc.); and

an interconnection network coupled to the plurality of computational elements (Figure 2, Items 16, 18 and 20), the interconnection network operative to configure the plurality of heterogeneous computational elements (Column 10, Lines 38-44);

Wherein a first group of computational elements is configurable to form a first functional unit to implement a first function (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively);

Wherein a second group of computational elements is configurable to form a second functional unit to implement a second function (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively).

Marshall does not disclose

The computational elements are heterogeneous.

Further, he does not disclose the first and second functions being a system acquisition function and a communication function, respectively.

Further, he does not disclose the second group of computational elements as being reconfigurable to implement the system acquisition function if the communication function is idle.

Bertolet teaches:

A plurality of heterogeneous computational elements (Columns 1 and 2, Lines 63-67 and 1-4, respectively).

Marshall discloses it would be "desirable to develop reconfigurable structures which combine as best possible the advantages of both MATRIX and of conventional FPGAs" (Column 3, Lines 2-4). Bertolet teaches FPGAs are "heterogeneous in nature" (Column 1, Line 67).

Accordingly, it would have been obvious to a person of ordinary skill in the art that the heterogeneous nature of FPGAs as noted by Bertolet would be an important feature in the device disclosed by Marhsall because it would enable his device to be "programmed at different times with different configurations, each adapted for execution of a different computationally intensive task (Column 1, Lines 65-67).

Regarding the claimed second functional unit, it is considered inherent to a communication device that a functional unit will be used to implement a communication function.

As discussed in reference to claims 1, 29 and 32, it would have been obvious to modify Marshall in view of Bertolet to include the specific function limitations in view of the teachings of Vilmur, Tiedemann and Hardwick.

Concerning Claim 16, Vilmur further teaches:

the first functional unit is a searcher (Figure 1, Item 114).

Concerning Claim 17, Vilmur further teaches:

the communication device is a cellular phone (Figure 1, Item 104).

Concerning Claim 22, Marshall discloses:

a plurality of computational elements (Figure 1, Item 10; Column 5, Lines 52-55), the plurality of computational elements including a first computational element and a second computational element (Figure 1, Items 12 and 14), the first computational element having a first fixed architecture (Figure 1, Item 12; Column 5, Lines 62-65) and the second computational element having a second fixed architecture (Figure 1, Item 14; Column 5, Lines 65-67), the first fixed architecture being different than the second fixed architecture; and

an interconnection network coupled to the plurality of computational elements (Figure 2, Items 16, 18 and 20), the interconnection network operative to configure a first group of computational elements to form a first functional unit for a first functional mode of a plurality of functional modes, in response to first configuration information (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively; it is taken that a reconfigurable entity will be in the configuration mode that the reconfigurable entity is configured to function as – e.g. being configured to perform a system acquisition function puts the configurable entity in a system acquisition mode), and the interconnection network further operative to reconfigure a second group of computational elements to form a second functional unit for a second functional mode of the plurality of functional modes, in response to second configuration information (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively), the first functional mode being different than the second functional mode, and the plurality of functional modes including system acquisition operations, linear algorithmic operations, non-linear algorithmic operations,

finite state machine operations, memory operations, and bit-level manipulations (Columns 12 and 13 and 14, Lines 54-60 and Tables 2-4, respectively);

Marshall does not disclose

The computational elements are heterogeneous.

Further, he does not disclose the first and second moes being a system acquisition function and a communication function, respectively.

Further, he does not disclose the second group of computational elements as being reconfigurable to implement the first functional mode if the second functional mode is idle.

Bertolet teaches:

A plurality of heterogeneous computational elements (Columns 1 and 2, Lines 63-67 and 1-4, respectively).

Marshall discloses it would be "desirable to develop reconfigurable structures which combine as best possible the advantages of both MATRIX and of conventional FPGAs" (Column 3, Lines 2-4). Bertolet teaches FPGAs are "heterogeneous in nature" (Column 1, Line 67).

Accordingly, it would have been obvious to a person of ordinary skill in the art that the heterogeneous nature of FPGAs as noted by Bertolet would be an important feature in the device disclosed by Marhsall because it would enable his device to be "programmed at different times with different configurations, each adapted for execution of a different computationally intensive task (Column 1, Lines 65-67).

Regarding the claimed second functional mode, it is considered inherent to a communication device that one such mode that will need to be implemented by a functional unit is a communication mode.

As discussed in reference to claims 1, 29 and 32, it would have been obvious to modify Marshall in view of Bertolet to include the specific function limitations in view of the teachings of Vilmur, Tiedemann and Hardwick.

Concerning Claim 23, Vilmur further teaches:

the first functional mode is the system acquisition operations (Figure 1, Items 116, 114 and 128; Column 6, Lines 35-43) and the first functional unit is a searcher (Figure 1, Item 114).

Concerning Claim 24, Vilmur further teaches:

the communication device is a cellular phone (Figure 1, Item 104).

Concerning Claim 36, Marshall discloses:

A method for allocating hardware resources within a communication device, the hardware resources including a plurality of computational elements (Figure 1, Item 10; Column 5, Lines 52-55), the method comprising:

Wherein a first group of computational elements is configurable to form a first functional unit to implement a first function (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively);

Wherein a first group of computational elements is reconfigurable to form a second functional unit to implement a second function (Figures 13-15; Columns 16 and 17, Lines 60-67 and 1-10, respectively).

Marshall does not disclose

The computational elements are heterogeneous.

Further, he does not disclose the first group of computational elements as being configurable for implementing a system acquisition function and reconfigurable to implement a communication function.

Bertolet teaches:

A plurality of heterogeneous computational elements (Columns 1 and 2, Lines 63-67 and 1-4, respectively).

Marshall discloses it would be "desirable to develop reconfigurable structures which combine as best possible the advantages of both MATRIX and of conventional FPGAs" (Column 3, Lines 2-4). Bertolet teaches FPGAs are "heterogeneous in nature" (Column 1, Line 67).

Accordingly, it would have been obvious to a person of ordinary skill in the art that the heterogeneous nature of FPGAs as noted by Bertolet would be an important feature in the device disclosed by Marhsall because it would enable his device to be "programmed at different times with different configurations, each adapted for execution of a different computationally intensive task (Column 1, Lines 65-67).

Regarding the claimed second functional unit, it is considered inherent to a communication device that a functional unit will be used to implement a communication function.

As discussed in reference to claims 1, 29 and 32, it would have been obvious to modify Marshall in view of Bertolet to include the specific function limitations in view of the teachings of Vilmur, Tiedemann and Hardwick.

Concerning Claim 37, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick teach:

in response to the first configuration information (Hardwick: Figure 7, Item 708), the first group of heterogeneous computational elements is configured to form one or more functional units to implement the system acquisition function (Vilmur: Figure 1, Items 116, 114 and 128; Column 6, Lines 35-43).

Concerning Claim 38, Vilmur further teaches:

each of the one or more functional units is a searcher (Figure 1, Item 114).

Concerning Claim 39, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick further teach

the first configuration information is generated when the system acquisition function is needed and the second configuration information is generated when the system acquisition function is completed.

Because the ability of a wireless communication device to communicate is contingent upon its acquisition of a system, it would have been obvious to a person of ordinary skill in the

art to generate configuration information to affect a reconfigurable group of computational elements to perform configure the elements to perform the system acquisition function.

Further, it would have been obvious to a person of ordinary skill in the art to generate a second configuration information for the purposes of reconfiguring some of the first group of computational elements to perform a communication function so that the communication device may perform its most fundamental task.

7. Claims 4, 6, 11, 13, 18, 20 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall in view of Bertolet and in further view of Vilmur, Tiedemann, Hardwick and Ito (6,408,039).

Concerning Claims 4 and 18, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick teach:

if the communication function is idle, the one or more of the second group of heterogeneous computational elements are reconfigurable to implement the system acquisition function (See above Claim 1 rejection).

They do not provide teachings for implementing additional instances of the first functional unit.

Ito teaches:

Implementing the system acquisition function by forming one or more additional instances of the first functional unit (Column 7, Lines 32-34).

Ito provides teachings for a variable number of searchers for system acquisition because the solution of providing a static amount of additional searchers "make it necessary to increase the size of the receiver, add components which are used during only a portion of the time the

receiver is in operation, and increase the power consumed by the receiver" (Column 1, Lines 58-62).

Accordingly, it would have been obvious to a person of ordinary skill in the art to implement the dynamically reconfigurable communications device taught by Marshall, Bertolet, Vilmur, Tiedemann and Hardwick in a manner reflective of the teachings of Ito, such that multiple instances of a system acquisition function may be present only when needed to save on power and compactness of the final product.

Concerning Claims 6 and 20, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick teach:

if the communication function is idle, the one or more of the second group of heterogeneous computational elements are reconfigurable by the interconnection network to implement the system acquisition function.

Marshall, Bertolet, Vilmur, Tiedemann and Hardwick do not teach the second group of elements as being reconfigurable to implement one or more of the plurality of functions other than the communication function.

Ito teaches:

Implementing one or more of the plurality of functions other than the communication function (Column 4, Lines 30-33; the function can be either a searcher or a finger unit).

Ito provides teachings for a variable number of searcher and finger units because the solution of providing a static amount of additional searchers "make it necessary to increase the size of the receiver, add components which are used during only a portion of the time the

receiver is in operation, and increase the power consumed by the receiver" (Column 1, Lines 58-62).

Accordingly, it would have been obvious to a person of ordinary skill in the art at the time of invention to use resources initially provided to the communication function for the implementation of a variety of other functions such as a searcher or finger unit based upon the activity level of the communication function for the purposes of improving power efficiency and space consumption.

Concerning Claims 11 and 25, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick teach

if the communication mode is idle, the one or more of the second group of heterogeneous computational units are reconfigurable to implement the system acquisition mode (See above Claim 8 rejection).

They do not provide teachings for implementing additional instances of the first functional unit.

Ito teaches:

Implementing the system acquisition function by forming one or more additional instances of the first functional unit (Column 7, Lines 32-34).

Ito provides teachings for a variable number of searchers for system acquisition because the solution of providing a static amount of additional searchers "make it necessary to increase the size of the receiver, add components which are used during only a portion of the time the receiver is in operation, and increase the power consumed by the receiver" (Column 1, Lines 58-62).

Accordingly, it would have been obvious to a person of ordinary skill in the art to implement the dynamically reconfigurable communications device taught by Marshall, Bertolet, Vilmur, Tiedemann and Hardwick in a manner reflective of the teachings of Ito, such that multiple instances of a system acquisition function may be present only when needed to save on power and compactness of the final product.

Concerning Claims 13 and 27, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick teach:

if the communication mode is idle, the one or more of the second group of heterogeneous computational units are reconfigurable to implement the system acquisition function (See above Claim 8 rejection).

Marshall, Bertolet, Vilmur, Tiedemann and Hardwick do not teach the second group of elements as being reconfigurable to implement one or more of the plurality of functions other than the communication function.

Ito teaches:

Implementing one or more of the plurality of operating modes other than the communication mode (Column 4, Lines 30-33; the functional unit can be either a searcher or a finger unit and thus be either in a searcher or finger mode).

Ito provides teachings for a variable number of searcher and finger units because the solution of providing a static amount of additional searchers "make it necessary to increase the size of the receiver, add components which are used during only a portion of the time the receiver is in operation, and increase the power consumed by the receiver" (Column 1, Lines 58-62).

Accordingly, it would have been obvious to a person of ordinary skill in the art at the time of invention to use resources initially provided to the communication mode for the implementation of a variety of other operating modes such as a searcher or finger mode based upon the activity level of the communication mode for the purposes of improving power efficiency and space consumption.

8. Claims 5, 12, 19 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall in view of Bertolet and in further view of Vilmur, Tiedemann, Hardwick and Snyder (2002/0087829).

Concerning Claims 5 and 19, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick teach:

if the communication function is idle, one or more of the first group of heterogeneous computational elements is reconfigurable to implement the system acquisition function.

Marshall, Bertolet, Vilmur and Tiedemann do not teach:

Reconfiguring the first and second groups of functional units to create a single system acquisition function.

Snyder teaches:

A communication system possessing a number of scaleable functional units (Figure 1, Item 106; Paragraph 15, Lines 7-8) wherein the scaleable functional units have a varying complexity based upon the number of complex arithmetic elements used by the functional unit (Paragraph 19).

Snyder designs his communication system in this fashion because he finds "the overall processing capability of SFU 106 is directly related to the number of CAEs in SFU 106"

(Paragraph 20, Lines 18-21). With greater processing capability comes greater processing efficiency.

Therefore, it would have been obvious to a person of ordinary skill in the art to enable the teachings of Marshall, Bertolet, Vilmur, Tiedemann and Hardwick to use the reconfigurable nature of the first and second functional units to implement a single functional unit as taught by Snyder to arrive at the limitations of the claim for the implementation of a new system acquisition function that possesses greater processing capability.

Concerning Claims 12 and 26, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick teach:

if the communication mode is idle, one or more of the first group of heterogeneous computational elements is reconfigurable to implement the system acquisition mode.

Marshall, Bertolet, Vilmur, Tiedemann and Hardwick do not teach:

Reconfiguring the first and second groups of computational elements to create a single functional unit to implement a system acquisition mode.

Snyder teaches:

A communication system possessing a number of scaleable functional units (Figure 1, Item 106; Paragraph 15, Lines 7-8) wherein the scaleable functional units have a varying complexity based upon the number of complex arithmetic elements used by the functional unit (Paragraph 19).

Snyder designs his communication system in this fashion because he finds "the overall processing capability of SFU 106 is directly related to the number of CAEs in SFU 106"

(Paragraph 20, Lines 18-21). With greater processing capability comes greater processing efficiency.

Therefore, it would have been obvious to a person of ordinary skill in the art to enable the teachings of Marshall, Bertolet, Vilmur, Tiedemann and Hardwick to use the reconfigurable nature of the first and second functional units to implement a single functional unit as taught by Snyder to arrive at the limitations of the claim for the implementation of a new system acquisition mode that possesses greater processing capability.

9. **Claims 7, 14, 20 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall in view of Bertolet and in further view of Vilmur, Tiedemann, Hardwick, Snyder (2002/0087829) and Ito (6,408,039).**

Concerning Claims 7 and 20, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick teach:

one or more of the first group of heterogeneous computational elements are reconfigurable by the interconnection network to implement the system acquisition function.

Ito teaches:

A finger unit is a function used in a communication device (Column 2, Lines 10-11).

Snyder teaches:

A communication system possessing a number of scaleable functional units (Figure 1, Item 106; Paragraph 15, Lines 7-8) wherein the scaleable functional units have a varying complexity based upon the number of complex arithmetic elements used by the functional unit (Paragraph 19).

Snyder designs his communication system in this fashion because he finds "the overall processing capability of SFU 106 is directly related to the number of CAEs in SFU 106" (Paragraph 20, Lines 18-21). With greater processing capability comes greater processing efficiency.

Therefore, it would have been obvious to a person of ordinary skill in the art to enable the teachings of Marshall, Bertolet, Vilmur, Tiedemann and Hardwick to use the reconfigurable nature of the first and second functional units to implement a third functional unit or finger unit as taught by Ito to arrive at the limitations of the claim for the implementation of a third function such as the function described by Ito.

Concerning Claim 14, 28, Marshall, Bertolet, Vilmur, Tiedemann and Hardwick teach:

one or more of the first group of heterogeneous computational elements are reconfigurable by the interconnection network to implement the system acquisition mode.

Ito teaches:

A finger mode is an operating mode used by a functional unit in a communication device (Column 2, Lines 10-11).

Snyder teaches:

A communication system possessing a number of scaleable functional units (Figure 1, Item 106; Paragraph 15, Lines 7-8) wherein the scaleable functional units have a varying complexity based upon the number of complex arithmetic elements used by the functional unit (Paragraph 19).

Snyder designs his communication system in this fashion because he finds "the overall processing capability of SFU 106 is directly related to the number of CAEs in SFU 106" (Paragraph 20, Lines 18-21). With greater processing capability comes greater processing efficiency.

Therefore, it would have been obvious to a person of ordinary skill in the art to enable the teachings of Marshall, Bertolet, Vilmur, Tiedemann and Hardwick to use the reconfigurable nature of the first and second functional units to implement a third functional mode or finger mode as taught by Ito to arrive at the limitations of the claim for the implementation of a third mode such as the mode described by Ito.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew A. Henry whose telephone number is (571) 272-3845. The examiner can normally be reached on Monday - Friday (8:00 am -5:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Browne can be reached on (571) 272-3670. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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MAH

REHANA PERVEEN
PRIMARY EXAMINER